LISTING OF CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A method for heating a melt ~~(22)~~ in a melting vessel ~~(3)~~ with cooled walls, comprising:

conductively heating the melt ~~(22) being conductively heated, and the current~~ by flowing current between at least two cooled electrodes ~~(5, 501, 502)~~, wherein the at least two cooled electrodes ~~(5, 501, 502)~~ each replace part of the cooled walls ~~(14, 16)~~ of the melting vessel ~~(3)~~ so that a melt contact surface of the at least two cooled electrodes forms a wall region of the melting vessel.

2. (Currently amended) The method as claimed in claim 1, ~~characterized in that at least~~ further comprising conductively heating a region of the melt ~~is heated by the current~~ to a temperature ~~which~~ that is above ~~the application limit temperature, in particular above the~~ a melting or decomposition temperature ~~of the melt contact material~~ of at least one of the at least two cooled electrodes ~~(5, 501, 502)~~.

3. (Currently amended) The method as claimed in claim 1 ~~or 2~~, ~~wherein~~ further comprising cooling the at least two cooled electrodes ~~(5, 501, 502) are cooled in a manner which~~ so that the at least two cooled electrodes can be set and/or controlled separately.

4. (Currently amended) The method as claimed in claim 1~~, 2 or 3~~, wherein the at least two cooled electrodes ~~(5, 501, 502)~~ are inserted into cutouts in the cooled walls of the melting vessel.

5. (Currently amended) The method as claimed in ~~one of claims 1 to 4, wherein the cooling is effected by~~ claim 1, further comprising passing at least one cooling fluid~~, in particular air and/or water,~~ through the at least two cooled electrodes ~~(5, 501, 502)~~ to effectuate cooling.

6. (Currently amended) The method as claimed in claim 5, wherein the at least one cooling fluid comprises ~~cooling is effected by passing through~~ a gaseous cooling fluid~~, in particular air, by means of a low-pressure blower~~.

7. (Currently amended) The method as claimed in claim 6,~~ wherein the coolant is passed~~ further comprising passing the gaseous cooling fluid through the at least two cooled electrodes ~~(5, 501, 502)~~ with a pressure difference of less than 1,000 mbar~~, preferably less than 500 mbar, particularly preferably less than 150 mbar~~.

8. (Currently amended) The method as claimed in ~~one of claims 1 to 7, wherein the melt is~~ claim 1, further comprising additionally ~~heated~~ heating the melt by the introduction of radiant energy~~, in particular by infrared radiation~~.

9. (Currently amended) The method as claimed in ~~one of claims 1 to~~ claim 8, wherein the melt ~~(22)~~ is heated by alternating current~~, preferably~~ with an alternating current frequency in a range from 50 Hz to 50 kHz~~, particularly preferably with an alternating current frequency in a range from 2 kHz to 10 kHz~~.

10. (Currently amended) The method as claimed in ~~one of claims 1 to 9, wherein the~~ claim 1, further comprising keeping a temperature of the cooled walls ~~(14, 16)~~ of the melting vessel ~~(3)~~ and of the at least two cooled electrodes ~~(5, 501, 502) is kept~~ below a temperature at which high levels of corrosion occur.

11. (Currently amended) The method as claimed in ~~one of claims 1 to 10, wherein the~~ claim 1, further comprising keeping a temperature of the melt ~~(22) is kept at least in a range~~ above 1,600°C~~, preferably above 1 700°C~~.

12. (Currently amended) The method as claimed in ~~one of claims 1 to 11, wherein the~~ claim 1, further comprising keeping a temperature of the melt-contact surface of the at least two cooled electrodes ~~(5, 501, 502) is kept~~ below 1,650°C~~, preferably below 1 500°C~~.

13. (Currently amended) The method as claimed in ~~claims 1 to 12, wherein the~~ claim 1, further comprising maintaining a temperature difference between the melt ~~(22)~~ in ~~the~~ an edge region of the melting vessel ~~(3)~~ and the melt ~~(22)~~ in ~~the~~ a central region of the melting ~~unit~~ vessel ~~amounts~~ to more than 150°K~~, preferably more than 250°K~~.

14. (Currently amended) The method as claimed in ~~one of claims 1 to 13~~ claim 1, wherein ~~the conductivity of~~ the melt ~~(22)~~ at ~~the~~ a melting temperature has an electrical conductivity in a range from 10^{-3} to 10^{2} Ω^{-1}* cm^{-1}~~, preferably in a range from 10^{-2} to 10^{1} Ω^{-1}* cm^{-1}~~.

15. (Currently amended) The method as claimed in ~~one of claims 1 to 14, wherein for a given heating power~~ claim 1, wherein the current ~~which~~ that emerges from the at least two cooled electrodes ~~(5, 501, 502)~~ into the melt ~~(22)~~ does not exceed a current density of 5 A/cm^2 ~~at any point~~.

16. (Currently amended) The method as claimed in ~~one of claims 1 to 15, wherein~~ claim 1, further comprising continuously supplying a melting material to the melting vessel and continuously discharging the melt from the melting vessel ~~is supplied and discharged continuously~~.

17. (Currently amended) The method as claimed in claim 16, wherein the melting material is supplied in molten form via an inlet ~~(9)~~ and the melt is discharged in molten form via an outlet ~~(10)~~.

18. (Currently amended) The method as claimed in claim 16 ~~or 17~~, wherein the ~~heating~~ current flows between the at least two cooled electrodes substantially along ~~the~~ a main direction of flow of the melt ~~(22)~~ or perpendicular with respect thereto.

19. (Currently amended) The method as claimed in claim 18, further comprising setting ~~in which~~ a temperature difference of more than 150°K~~, preferably of more than 250°K, is set~~ between the melt-contact surface of the at least two cooled electrodes and a region of the melt ~~(22)~~ located substantially centrally between the at least two cooled electrodes.

20. (Currently amended) The method as claimed in ~~one of claims 17 to 19~~ claim 17, wherein the inlet ~~(9)~~ supplies the melting material and the outlet ~~(10) supply and~~ discharges the melt~~ing material in the region of the~~ at a ~~melt bath~~ surface of the melt~~(24)~~.

21. (Currently amended) The method as claimed in ~~one of claims 1 to 20, wherein~~ claim 1, further comprising heating at least one electrode of the at least two cooled electrodes ~~(5, 501, 502) is heated~~ at least from time to time.

22. (Currently amended) The method as claimed in claim 21, wherein the heating of the at least one electrode is effected by transverse application of current to the melt-contact ~~material~~ surface of the at least one electrode.

23. (Currently amended) The method as claimed in ~~one of claims 1 to 22, which includes a starting operation in which~~ claim 1, further comprising providing a melt path of sufficient electrical conductivity ~~is provided~~ between the at least two cooled electrodes in the melting vessel during a starting operation.

24. (Currently amended) The method as claimed in claim 23, further comprising heating ~~wherein~~ the at least two cooled electrodes and/or parts of the cooled walls[[,]] during the starting operation~~, are heated by a heating apparatus~~ to a sufficient temperature for their temperature to be above ~~the~~ a dew point of the ~~furnace upper atmosphere~~ melting vessel.

25. (Currently amended) The method as claimed in claim 23 ~~or 24, wherein to melt down the melting material~~ , further comprising introducing starting electrodes ~~are introduced~~ into the melting vessel and passing a current ~~is passed~~ through the melting material via the starting electrodes so that the melting material is melted down.

26. (Currently amended) The method as claimed in claim 25, ~~wherein~~ further comprising moving the starting electrodes ~~are moved~~ away from one another during the starting operation.

27. (Currently amended) The method as claimed in ~~one of claims 23 to 26, which incorporates melt conversion~~ claim 23, further comprising converting from a melt with a higher electrical conductivity to a melt with a lower electrical conductivity.

28. (Currently amended) The method as claimed in ~~one of claims 23 to 27, wherein~~ claim 25, further comprising pushing the staring electrodes ~~are pushed~~ together before the starting operation and ~~are pulled~~ pulling the starting electrodes apart during the starting operation.

29. (Currently amended) The method as claimed in ~~one of claims 23 to 28, wherein~~ claim 23, further comprising feeding radiant energy~~, in particular infrared radiation, is fed~~ to the melting material in order for the latter to be melted down during the starting operation.

30. (Currently amended) An apparatus ~~(1)~~ for the heating of melts~~, in particular for the high-temperature refining of melts~~, comprising:

a melting vessel ~~(3)~~ with cooled walls ~~(14, 16)~~ for receiving a melting material, and

at least two electrodes ~~(5, 501, 502)~~ for conductively heating ~~the~~ a melt ~~(22)~~, wherein the at least two electrodes ~~(5, 501, 502)~~ each have a melt contact surface that replaces part of the cooled walls ~~(14, 16)~~ of the melting vessel ~~(3)~~.

Claims 31 through 71 (Cancelled).